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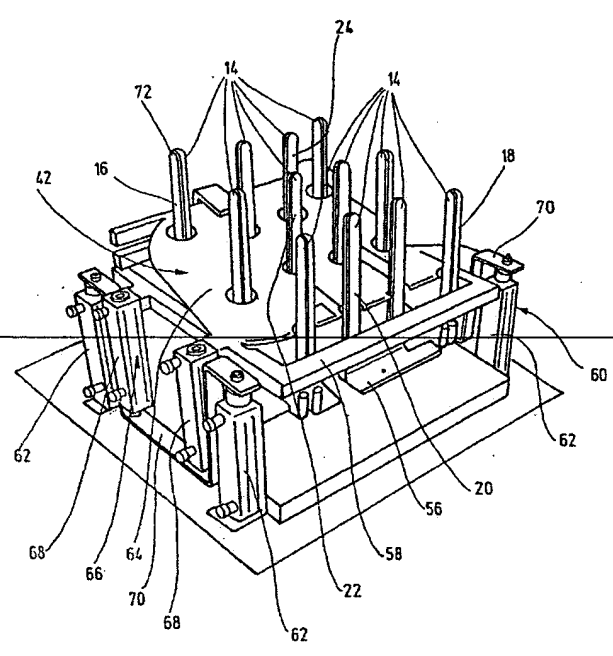
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DEVICE FOR MOUNTING SEAT COVERS



WO 2004/018347 A1

(54) Bezeichnung: VORRICHTUNG ZUM MONTIEREN VON SITZBEZÜGEN



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(57) Abstract: The invention relates to a device for mounting any type of seat covers (10) on foam cushion parts (12) of a seat, more particularly a vehicle seat, using gripping elements (14) which form actuation groups (16, 18, 20, 22, 24) receiving the profiled strips (26, 28, 30, 32, 34) that are arranged in the seat cover (10) and which pull the profiled strips (16, 18, 20, 22, 24) into channel-like recesses (44, 46, 48, 50, 52) in the foam cushion part (12) by means of a positioning device (42) that tolerates a relative movement between the foam cushion part (12) and the corresponding gripping element (14), thereby fixing the seat cover (10) to the foam cushion part (12).

(57) Zusammenfassung: Die Erfindung betrifft eine Vorrichtung zum Montieren von Sitzbezügen (10) jeder Art an Schaum- polsterteilen (12) eines Sitzes, insbesondere Fahrzeugsitzes mit Greifelementen (14), die in Betätigungsgruppen (16, 18, 20, 22, 24) zusammengefasst der Aufnahme von am Sitzbezug (10) angeordneten Profileisten (26, 28,

[Fortsetzung auf der nächsten Seite]

Invention

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### ~~Device for Mounting Seat Covers~~

The present invention relates to a device for mounting seat covers of any type on foam cushion components of a seat, a vehicle seat in particular.

#### ~~In the category of~~ Background of the Invention

In making vehicle seats, ~~to which~~including aircraft passenger seats ~~also belong, in with~~ the more recent seat technology generation, the previously customary wire insertion and tensioning systems have been replaced by a section fastening system (~~in this connection see~~, for example, DE 198 08 995 C1). In this new generation of section fastening systems, individual section strips, ~~which may consist~~ of cloth, leather, plastic materials, or the like, are mounted so as to be joined to the seat cover by ~~way of~~ sew-on narrowing strips. The respective section strips are oriented along the sew-on narrowing strips of the seat covers with respect to their extent and their length. The associated foam upholstery components of a particular seat, which are to be covered, ~~consist~~ are formed of a conventional flexible foam material, such as polyurethane foam ~~and the~~. ~~The seat component in question~~, together with its foam cushion, has on its side facing the seat cover channel-like recesses into which the respective section strip may be introduced, by hand, for example, for a process of fastening the seat cover on the foam cushion component.

The section introduced in this manner has flank elements on the side edge ~~and the~~ ~~respective~~. The flank elements extend under the end sides of the foam cushion component;

~~which delimit~~ delimiting a channel-like central recess by which the section component may be introduced into the respective foam channel. One significant advantage of ~~the~~ this section fastening systems ~~in question~~ is that in the case of worn out seat covers or foam cushion components, such components may be replaced, by disengaging the section component mounted on the seat cover from the channel introduced into the foam cushion component. The ~~respective~~ section ~~insert~~ inserted may be produced cost effectively as an extruded section, so that the fastening solution ~~described~~ may be applied cost effectively despite the manual assembly required.

~~On the basis of this state of the art, the~~ Summary of the Invention

An object of the present invention is to carry out provide a device for mounting seat covers where the assembly steps as described can be performed at least in part automatically ~~in order to obtain additional time and cost advantages.~~

~~The object as thus formulated is~~ is basically attained by a device having the ~~characteristics specified in claim 1 in its entirety.~~

~~Claim 1 specifies for the device claimed for the invention that gripping elements are clustered in actuation groups which serve to receive section strips mounted on the seat cover, the~~ The gripping elements pulling the section strips into channel-like recesses in the a foam cushion component by means of a positioning mechanism, which. The positioning mechanism permits relative movement between foam cushion component and the respective gripping element for the purpose of fastening the seat cover on the foam cushion component. The ~~respective~~ device permits essentially automatic operation of applying the respective section strip to the seat cover. The section strips, which are sewn on the lower side of the ~~respective~~ seat cover are accordingly introduced manually or automatically into the ~~respective~~ recesses in the gripping elements and fastened there. The gripping elements ~~in question~~ extend, in the fastening situation described, through recesses in the foam cushion component, which extend transversely relative to the

respective channel-like guides for the section strip ~~in question~~. As a result of relative movement of section strip and ~~accordingly~~ seat cover with respect to the channel-like recesses in the foam cushion component, the section strips are then fastened in the ~~respective~~ foam cushion component, the fastening process involved being fully automatic. As soon as a particular section strip has been introduced into the associated foam channel in the foam cushion component, positioning of the seat cover on the foam cushion component to define the edges may then be carried out manually or, optionally, fastening on the foam cushion component may be performed by other operating equipment. The covered foam cushion component thereby obtained is then released as a seat component from the device for subsequent use.

The device ~~claimed for~~ of the present invention may be specially adapted for special components of the seat involved, for example, for the headrest area, the backrest, the seat component itself, and, optionally, in the case of aircraft passenger seats, in the form of leg, foot, or calf rests.

Other advantageous embodiments of the device claimed for objects, advantages and salient features of the present invention will become apparent from the invention are specified in the dependent claims. Reference will now be made to the accompanying following detailed description, which, taken in conjunction with the annexed drawings which show an exemplary, discloses a preferred embodiment of the present invention and in which in the form of diagrams not drawn to

#### Brief Description of the Drawings

Referring to the drawings which form a part of this disclosure:

FIG. 1 is a diagrammatic, not-to-scale,

FIG. 1 ~~shows a perspective view of the device as a whole, according to one embodiment of the present invention~~ in the initial state;

FIG. 2 ~~is a perspective view of a process of introduction of~~ introducing the section strip of a seat cover into the associated openings for the gripping elements ~~as illustrated in of~~ FIG. 1;

FIG. 3 ~~is a perspective view of a removal position for a finished covered seat component as illustrated in FIGS. 2 and 3;~~

~~of the device of FIG. 1;~~

FIG. 4 ~~is a perspective view of the device of FIG. 1 in the removal position corresponding to that in of~~ FIG. 3 ~~for, with~~ the covered seat component, not shown;

FIG. 5 ~~is a perspective top view of a basic diagram illustrating a foam cushion component as seat component, together with the gripping elements of the device of FIG. 1 extending through the seat component; and~~

FIG. 6 ~~is a bottom plan view of a seat cover with section strips extending longitudinally and transversely joined to the cover material by way of sew-on narrowing strips, according to one embodiment of the present invention.~~

#### Detailed Description of the Invention

The device ~~claimed for the~~, according to an exemplary embodiment of the present invention, is shown in FIG. 1 in its initial state. The ~~respective~~ device is used for mounting seat covers of any type; ~~a~~. A bottom view of a seat cover is shown in FIG. 6, as an example. Such seat covers 10, which may ~~consist be~~ of a cloth or leather material, or optionally of plastic, are to be fastened on foam cushion components 12 (see FIG. 5, for example) ~~in order thus to obtain a~~

seat component for a vehicle passenger seat or aircraft passenger seat. ~~However, seat~~ Seat components such as these may also be employed as treatment chairs, for example, in an operating area or the like.

The exemplary embodiment illustrated relates directly to the seat component of a motor vehicle seat, ~~but other.~~ Other seat components may be comparably covered, for example, ones such as headrests, backrests, leg rests, etc. The device ~~claimed for~~ of the present invention has a plurality of gripping elements 14, twelve gripping elements 14 being used in the present case for covering a seat component. The ~~respective~~ twelve gripping elements 14 are clustered in five actuation groups 16, 18, 20, 22, and 24, and accordingly integrated. The respective gripping elements 14 are designed to receive section strips 26, 28, 30, 32, and 34, which are positioned on the seat cover (FIG. 6), it being possible to associate these section strips in the order indicated with the respective actuation groups of gripping elements 14. The section strips in question may be rigidly connected by ~~way of~~ sew-on narrowing strips 38 of conventional design to the lower side of the seat cover 10, and form in their longitudinal and transverse directions the corresponding seams 39, 40, on the upper side of the seat -component (see FIG. 3).

The device also has a positioning mechanism ~~designated as a whole as~~ 42, which, as is shown by comparison of FIGS. 1 and 4, ~~makes~~ permits relative movement between foam cushion component 12 and the ~~respective gripping element~~ elements 14 ~~possible~~. The purpose of the automated device is to pull the individual section strips 26, 28, 30, 30, 34, into the associated channel-like recesses 44, 46, 48, 50, and 52, ~~into in~~ in the foam cushion component 12. In this way, the seat cover 10 may be reversibly or releasably fastened to the foam cushion component 12, that is, may be detached from the ~~latter~~ foam cushion component, as is to be discussed in greater detail in ~~what follows~~ the following.

As shown in particular by the diagram in FIG. 5, ~~the each~~ each gripping element 14 ~~consists of~~ includes a ~~sort of~~ gripping tong, with each gripping tong having two tong components 54 that



~~may be moved~~moveably relative to each other.- The respective tong components 54 are formed by a longitudinal slot,~~which extends~~ extending along the ~~rod-like~~ longitudinal axis of the rod-shaped gripping element 14 ~~in its entirety~~. Gripping movement, that is a gripping process in which the gripping components are moved toward and detachably away from each other, is generated by a linear drive (~~not shown, such as one~~). The linear drive can be in the form of a pneumatic servomotor or a linear unit, for example, which makes the respective engagement movement possible. By preference, the linear drive in question (~~not shown~~) grips the base component 56 (see FIG. 5) of each gripping element 14 ~~and, obviously, a~~. A single drive is associated with ~~an each~~ each actuation group 16, 18, 20, 22, 24, so that the gripping or separation movement for the particular actuatable gripping element 14 is effected by ~~means of only one~~ drive for one actuation group collectively. Consequently, chronologically sequential actuation of the individual actuation ~~group groups~~ may be performed by the respective, preferably pneumatic, ~~drives~~ drives (not shown).

As is also shown in FIGS. 1 and 3, all gripping elements 14 are mounted ~~on~~ within a common frame component 58, which is vertically positionable by ~~means of a~~ first linear drive 60. The ~~respective first~~ linear drive has four operating cylinders 62 which, as is indicated in the figures, are mounted on the corners of the device, and accordingly enclose the gripping elements 14 together with the frame component 58 on the external circumference side. The frame component 58, ~~which~~ encloses the gripping elements 14 on the external circumference side, and may be moved to a position relative to the vertically stationary gripping elements 14 by ~~way of~~ the first linear drive 60. ~~In this context it~~ It would also be possible to have embodiments in which the gripping elements 14 could be vertically adjusted in relation to the base of frame component 58 by a drive (not shown). In the present embodiment, however, the gripping elements 14 are mounted so as to be vertically stationary and permit the gripping movement ~~already described~~ only in a plane extending transversely to the vertical.

In addition to the frame component 58 ~~in question~~, the positioning mechanism 42 has a support component 64 for supporting the foam cushion component 12 along or on its lower side. The ~~respective~~ support component 64 has openings through which the gripping elements 14 extend when the support component 64 is in a lowered position (see FIG. 1, for example). In addition, the gripping elements 14 are clear of these openings when such openings are in a raised position (see FIG. 4). Another or second linear drive 66 with four operating cylinders 68, preferably powered by pneumatic means, performs the function of placing the support component 64 in the form of a planiform or plate-like support element in individual positions; ~~the respective.~~ The four operating cylinders 68 are mounted, grouped in pairs, facing each other on a U-shaped frame piece 70, ~~the.~~ The free ends of which each U-shaped frame piece 70 are connected to the upper side of the ~~other~~ four operating cylinders 62 of first linear drive 60, and are raised together with the ~~other~~ four operating cylinders 68 of second linear drive 66 during their extension movement. This arrangement results in movement superimposed by ~~one first~~ linear drive 60 on that of the ~~other~~ second linear drive 66.

For a better understanding, ~~reference will now be made to~~ an operating process, that is, seat covering or an assembly process with the device ~~claimed for~~ of the present invention; is described.

The device ~~claimed for~~ of the present invention is initially in its base position as illustrated in FIG. 1. In this position, all gripping elements 14 are closed, that is, the gripping components 54 of each gripping element 14 are essentially adjacent to each other, and the head components 72 on the upper free ~~ends~~ ends of the gripping elements 14 also are not separated. In the base or initial position ~~in question~~, the foam cushion component 12 in the form of a conventional seat component, which forms a sort of bucket seat, is positioned on the gripping elements 14 ~~and these.~~ These gripping elements extend through channel-like recesses in the foam cushion component 12, which is oriented vertically, transversely to the channel-like recesses 44, 46, 48, 50, and 52, in the foam cushion component 12. The lower side of the foam

cushion component 12 is positioned on the upper side of the planiform support component 64. By ~~means of~~ the pneumatic control unit, the gripping elements 14 are then actuated, for example, by ~~way of~~ a foot-hand switch or the like ~~and such that~~ the tong components 54 of each gripping element 14 move apart, ~~so that~~ for the head component 72 ~~reaches to reach~~ a mounting position for each opened gripping element 14.

As is shown in FIG. 2, the first longitudinal section strip 26 may be introduced into the first actuation group 16 of gripping elements 14, either manually or by ~~way of~~ a handling system. The respective gripping elements 14 of the first actuation group 16 may then be closed. In a similar manner the other section strips 28, 30, 32, 34, are then introduced into the respective associated actuation groups 18, 20, 22, or 24, and the head components 72 move vertically to a corresponding axial distance from the associated channel-like recesses 44, 46, 48, 50, 52, in the foam cushion component 12. By preference, the process of introduction of the section strips takes place in the sequence 34, 32, 30, 26, 28. After the respective procedure of introduction has been completed, and provided that all gripping elements 14 are closed and enclose the respective section strips, the frame component 58 is raised together with the support component 64 by ~~way of~~ the first linear drive 60 with its four operating cylinders 62, as is shown in FIG. 3. The gripping elements 14, mounted to be stationary in the vertical direction, then pull the respective section ~~stripstrips~~ 26, 28, 30, 32, 34, in the associated upward movement into the associated ~~channelchannels~~ 44, 46, 48, 50, 52, in the foam cushion component 12 ~~and the~~. The section strips ~~involved are then~~ engaged in the associated channels.

In the respective installation situation, the edge components of the seat cover 10 are then pulled in over the associated cushion elements which surround the foam cushion component 12 on the edge ~~and the~~. The covering process involved is completed as shown in FIG. 3. The gripping elements are then opened and, as is illustrated in FIG. 4, the ~~othersecond~~ linear drive 66 is activated and the four other operating cylinders 68, acting on the U-shaped frame piece 70, move upward and in the process take at least the support component 64 upward with them. In

the respective lifting movement, the covered seat component is moved farther upward ~~and the~~. The head components 72 of the gripping elements 14, which in the meantime have been moved to the release position, and are disengaged from the associated channels in the foam cushion component 12, so that the latter. The foam cushion component, supplemented by the support component 64, may be then removed by hand or by ~~way of~~ a handling unit. All gripping elements 14 are then closed again and the two linear drives 60, 66, are then brought in, so that the device moves to its initial position as shown in FIG. 1 for a new covering process. A repeated covering process may now begin.

While one embodiment has been chosen to illustrate the invention, it will be understood by those skilled in the art that various changes and modifications can be made therein without departing from the scope of the invention as defined in the appended claims.

What is claimed is:

## DEVICE FOR MOUNTING SEAT COVERS

### Abstract of the Disclosure

A device for mounting any type of seat covers (10) on foam cushion parts (12) of a seat, more particularly a vehicle seat, uses gripping elements (14) which form actuation groups (16, 18, 20, 22, 24) receiving the profiled strips (26, 28, 30, 32, 34) arranged on the seat cover (10). The gripping elements pull the profiled strips (16, 18, 20, 22, 24) into channel-like recesses (44, 46, 48, 50, 52) in the foam cushion part (12) by a positioning device (42). The positioning device allows a relative movement between the foam cushion part (12) and the corresponding gripping element (14) to fix the seat cover (10) to the foam cushion part (12).